Heavy metals in surface waters and suspended solids from the Usciana River (Tuscany, central Italy)

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The Usciana River (Tuscany central Italy) is an artificial channel built in 1934 to reclaim and control the swamping waters of Padule di Fucecchio, which is located in the lower reaches of the Nievole River Valley, before it flows into the Arno River. During the last decades, an important tanning district developed in the surrounding of the Usciana River, which acts a significant anthropogenic pressure equivalent to about 2,250,000 inhabitants (Autorità di Bacino, 1998; Nisi et al., 2008). During the years, the Usciana River waters have been spoiled as testified by numerous events of fish die-off since 2001 (Pucci, 2001), the last one occurring in 2015 (Sabia, 2015). In 2003, the Regional Agency for the Environmental Protection has been started an ecological and chemical survey in order to monitor the status of the river waters (Bresciani et al., 2008), whose results indicated an extremely low quality of the surface waters, particularly related to the presence of large amounts of nutrients caused by urban and industrial wastes (Vannini et al., 2017). To evaluate the anthropogenic and natural contribution in the surface waters and suspended solids, original chemical and isotopic data from 13 sampling sites distributed along the Usciana River and before and after the confluence of the Arno River are presented. Trace and ultra-trace elements were determined by ICP-OES and ICP-MS at the Utrecht University (Netherlands) while Sr and Pb isotope ratios were measured by TIMS at the University of Study of Florence (Italy).

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